Nov. 1, 1932. A. H. ADAMS 1,885,211

IRONING ROLL AND PAD

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Fig. 1

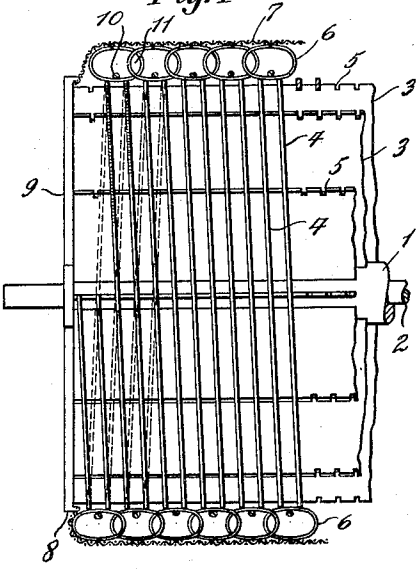



Fig. 2

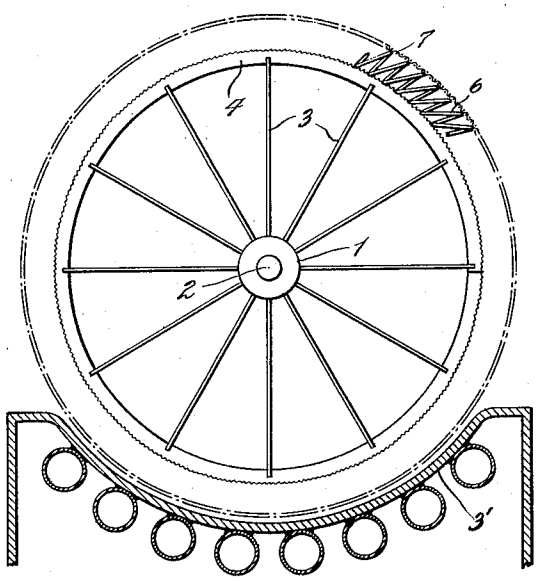



Fig. 3

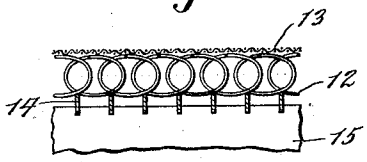



Fig. 4

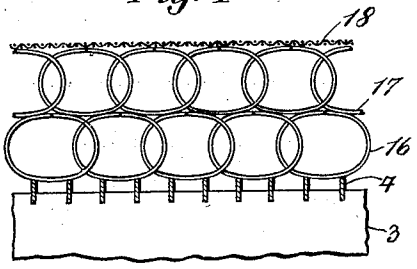



Fig. 5

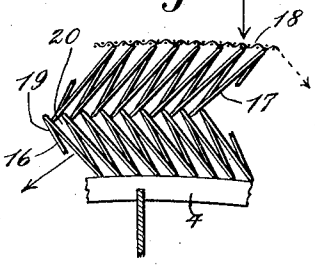
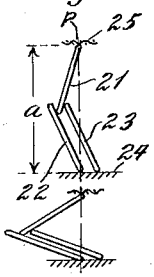



Fig. 12.




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Fig. 6

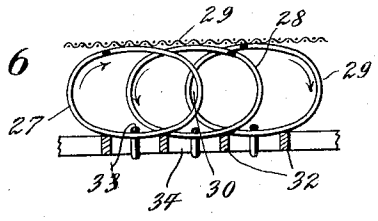



Fig. 7

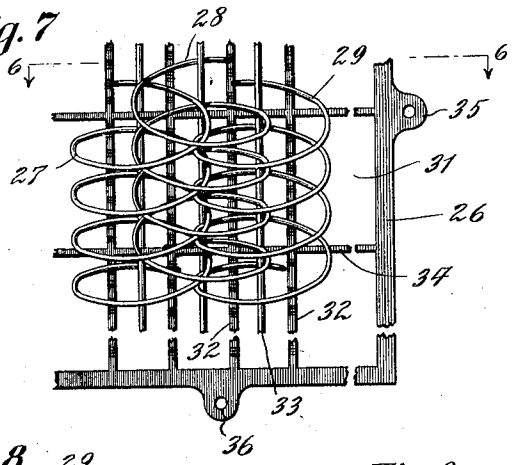



Fig. 8

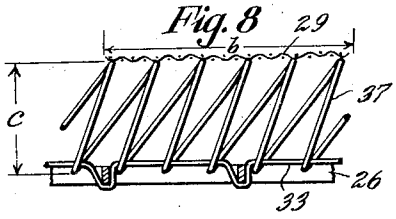



Fig. 9

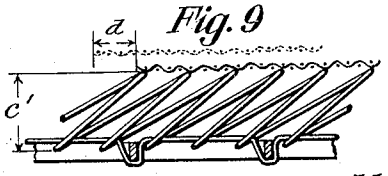



Fig. 10

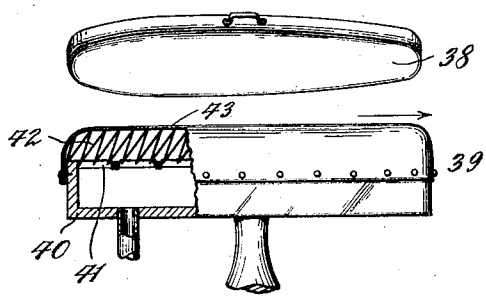
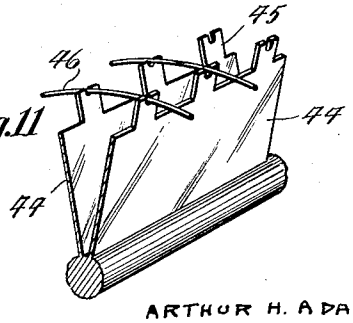



Fig. 11




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Patented Nov. 1, 1932 1,885,211

# UNITED STATES PATENT OFFICE

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## IRONING ROLL AND PAD

Application filed April 13, 1928. Serial No. 269,852.

This invention relates to laundry apparatus, and in particular to resiliently padded surfaces such as ironing rolls, pressing bucks, etc.

It is an object of the invention to provide an improved resiliently padded ironing element which is economical to manufacture, efficient in operation, and is not deleteriously affected by moisture from the garments being ironed.

The invention is in the nature of an improvement on the type of padded element disclosed in my copending application Serial No. 245,180, filed January 7, 1928. There is described in said application an ironing roll comprising a non-absorbent resilient padding supported on a perforated cylindrical base which permits, with some limitation the passage of steam or water vapor therethrough. It is an object of this invention to provide a skeleton base or support for a spring padding which reduces to a minimum the obstruction to the passage of steam therethrough.

A feature of the invention relates to an open work ironing base of grate-like form which offers little obstruction to the passage of steam or vapor therethrough and yet is sufficiently strong to support a resilient padding and to effect the ironing operation.

Another feature pertains to a spring padding wherein one or a plurality of convoluted springs are wrapped circumferentially around an ironing roll of the open-work skeleton type, said springs having adjacent convolutions overlapping one another to provide radial resiliency to the roll and to provide a substantially uniform ironing surface, necessitating only a relatively thin covering such as a finely woven wire mesh cloth.

A further feature pertains to a spring padding for an ironing roll or pressing buck comprising a series of convoluted skewed springs arranged with their axes parallel to one another, adjacent springs being wound in opposite directions and overlapping to provide a substantially flat uniform surface.

Another feature resides in the manner of mounting a spring padding on a grate like base and also to the manner of attaching said padding to the base.

A still further feature pertains to a resiliently padded pressing buck which, because of the structure of the padding, effects a wiping pressure on the garments when the press is closed.

Other features and advantages of the invention will be apparent after a consideration of the following description and the appended claims.

For the purpose of enabling a clear understanding to be attained of one mode of practising the invention the same will be disclosed in connection with an ironing machine of the rotating roll type, but it will be understood that it is capable of application to ironing or pressing machines generally wherein an ironing or pressing surface is provided with a resilient padding. Accordingly,

Fig. 1 of the drawings shows a portion of an ironing roll constructed in accordance with the invention and provided with a resilient padding according to the invention.

Fig. 2 is an end view in elevation of the roll shown in Fig. 1.

Fig. 3 is a detail view showing an alternative form of padding employing a plurality of separate convoluted springs and the manner of supporting and positioning adjacent springs.

Fig. 4 is another embodiment employing a plurality of superimposed layers of resilient elements on the open-work roll.

Fig. 5 is another view of the portion of roll and padding shown in Fig. 4.

Figs. 6 and 7 are views of another embodiment of the invention showing a resilient padding composed of a plurality of adjacent alternate right and left-hand springs mounted in over-lapping relation on the open-work base.

Figs. 8 and 9 are details illustrating the manner in which the garment supporting surface of the spring padding is displaced laterally when the padding is compressed.

Fig. 10 is a view of a portion of a press employing an open-work base and skewed spring padding according to the invention.

Fig. 11 is an alternative manner of sup-

porting the padding in an open-work roll employing radial fins with notches, and employing round heavy wire supports.

Fig. 12 is a schematic representation of the equalizing action of the padding of Fig. 5 when under compression.

As set forth in copending application Serial No. 245,180 hereinabove referred to, the use of an open-work ironing roll which is provided with a thoroughly pervious or non-absorbent resilient padding enables damp garments to be continuously ironed without the moisture from the garments affecting the resiliency of the padding proper, or interfering with the proper ironing of said garments. While pervious resilient paddings are known to the art, it has been found that unless the base or roll upon which the pad is mounted is of the same degree of perviousness, the efficiency of ironing is materially reduced. The present invention overcomes this disadvantage by employing a skeleton-like pad-supporting base which has a maximum of perviousness.

Referring particularly to Fig. 1, which shows a portion of an ironing roll sufficient to enable an understanding of the invention to be attained, it will be seen that the skeleton roll is in the form of an elongated wheel-like structure comprising a longitudinal hub 1 which is securely attached to the shaft 2 in any appropriate manner for rotation therewith, shaft 2 being connected to a source of motive power for rotating it at the required rate. Extending radially from the hub 1 and fastened thereto in any convenient manner are a plurality of pad supporting frames or fins 3. In this connection it may be noted that the fins 3 and hub 1 may take the form of plates welded to a heavy tube or of a single casting of metal. However, it is understood that for this purpose any suitable construction of metal or other material may be employed instead of welded or cast metal.

For the purpose of supporting the roll covering in the spaces between adjacent fins, there are wound helically around the fins 3 in double screw thread fashion strips 4 of suitable material, such as wire or flat metal strip which is fastened at both ends in any convenient manner to prevent unwinding. As shown, the strips 4 are prevented from lateral displacement by being seated in notches 5, in members 3, which notches are arranged in helically staggered fashion. The resilient padding comprises a convoluted spring 6 of the type disclosed in copending application Serial No. 245,180 hereinabove referred to, said spring having the individual turns thereof permanently skewed at an angle to the axis of the spring. This skewed spring is wrapped around the roll frame-work in the grooves formed by adjacent turns of the strips 4, with the spring turns slanting in a direction opposite to that in which the roll rotates, it being understood that the spring is appropriately fastened at both ends to prevent unwinding. As indicated by the numeral 7, one or more layers of finely woven wire mesh cloth are wrapped around the spring padding 6 with the ends of the cloth fastened, preferably in the manner disclosed in the application hereinabove referred to, to which reference may also be had for the preferred form of metal mesh covering to be used. If desired, the ends of the mesh covering 7 may be clamped to the skeleton roll by the overturned edges of the end closing plates 9. In order to prevent creeping of the spring 6 relative to the members 4, these latter members may have their edges roughened or corrugated, and a continuous wire 10 may be passed through the spring convolutions thus being spirally wound around the roll and fastened at both ends to tie the spring firmly against the roll structure.

It is preferred to wrap spring 6 around the roll in such a manner that alternate convolutions of adjacent turns overlap, as indicated by the numeral 11. This overlapping is possible since the convolutions are all inclined at the same angle. Furthermore, this overlapping provides a substantially uniformly resilient continuous surface for supporting the covering 7, thus preventing permanent deformation to the latter by the passage of small hard objects such as buttons or the like through the ironer.

From the foregoing description, it will be seen that, due to the complete open-work structure of the skeleton roll and the character of the resilient padding, any steam which is driven from the garments being ironed finds a substantially unobstructed path into the interior of the roll and has very little or no tendency to condense within the body of the padding. This tendency to condense is further reduced by the fact that the padding is substantially all metal and is capable of conducting sufficient heat from the steam chest surface, represented in Fig. 2, schematically by the numeral 3', to vaporize any moisture that may find its way into the body of the padding. In this connection it may be noted that while any well known form of steam chest may be employed, it is preferable to use the type disclosed in application Serial No. 249,683 filed January 26, 1928. After prolonged use, the interior of the roll may become filled with a body of steam which will also serve to maintain the temperature of the padding sufficiently high to prevent condensation.

Fig. 3 shows an alternative embodiment in which the spring padding, instead of taking the form of a single convoluted spring helically wound around the roll, comprises a plurality of separate convoluted springs 12, 13, etc. wound around the roll parallel to one another and supported and separated by the

strips 14 which, in this embodiment, are in the form of circular bands circumferentially disposed around longitudinal members 15 similar to the members 3 of Figs. 1 and 2. The convoluted springs 12, 13, etc., it will be understood, are also skewed in the same manner as is spring 6 of the embodiment of Figs. 1 and 2.

Figs. 4 and 5 show an alternative embodiment in which the resilient padding comprises a plurality of alternate layers of convoluted skewed springs 16 and 17 and mesh covering 18. As shown in the end view of Fig. 5, the alternate layers of springs are arranged so that the spring turns are inclined in opposite directions. Either the arrangement disclosed in Fig. 1 or that disclosed in Fig. 3 may be employed as far as the constitution of the spring pad is concerned; that is, the padding layers of Figs. 4 and 5 may consist of a single helically wrapped spring or a plurality of adjacent parallel springs.

It will also be noted that the springs are braced against each other by having each convolution of spring 17 supported by two adjacent convolutions of spring 16 as indicated by the numerals 19 and 20. By this arrangement, when a pressure is applied to the covering 18, due to the skewed character of spring 17, the said covering would normally be compressed downwardly toward the right as represented by the dotted arrow. However, due to the bracing of the spring 17 against spring 16, this compressive force is also transmitted to the supporting convolutions of the latter spring, causing them to move in the direction of the solid arrow. The result of this combined angular compression of springs 17 and 16 is that the covering 18 instead of moving downwardly at an angle and thus effecting a wiping action on the garments, is caused to move downwardly substantially in the direction of the vertical arrow. This equalizing effect, of course, results from the fact that springs 16 and 17 are normally skewed to equal degrees, but in opposite directions. The schematic representation of Fig. 12 it is believed will render this equalizing action clear. The upper portion of this figure shows a single skewed spring convolution 21 which is supported by the convolutions 22 and 23 of another oppositely skewed spring, both of which are supported on base 24 to which the convolutions 22 and 23 are fastened. The covering 25 in the normal positions of the spring convolutions is separated a distance "*a*" from the base 24. When pressure is applied to the covering 25 the convolutions 21, 22 and 23 act as a sort of toggle joint with the result that the covering moves downwardly to the position shown in the lower portion of Fig. 12 so that any given point "*p*" for example, of the depressed covering is not given any substantial lateral displacement.

Referring to Figs. 6 and 7, there is shown another embodiment of the invention in which the pad base comprises a lattice-like structure 26 preferably in the form of a metal plate. However, it will be understood that a coarse-wire mesh structure may be employed in place of such plate, the main essential being the provision of a relatively thin base which has a minimum of obstructing surface for the passage of steam or vapor, and at the same time is sufficiently strong to support the goods under pressure without permanent deformation. As shown clearly in Fig. 6, there is mounted upon the base 26 a spring padding comprising alternate left and right-hand springs 27, 28, 29, etc., all of which are skewed in the same direction. The right-hand wound springs 27 and 29 are in over-lapping arrangement as indicated by the numeral 30 and as described in connection with Figs. 1 to 4 to provide a uniform supporting surface for the covering 29. In order to still further insure the uniformity of this surface, the left-hand wound spring 28 overlaps the adjacent right-hand springs 27, 29. This overlapping of both the right-hand springs with each other and with the intermediate left-hand spring can be readily effected since all the springs are skewed at the same angle and are normally separated sufficiently to provide the requisite overlapping clearance. The springs are seated within the openings 31 in base 26 and are supported by the longitudinally extending ribs 32 which are preferably roughened to prevent creep of the springs thereover. For the purpose of securely fastening the springs 27, 28, 29, etc. to the base 26, a wire or cord 33 is threaded through the convolutions and passes under the cross-ribs 34. A structure such as disclosed in Figs. 6 and 7 is particularly well suited for the bucks of pressing machines, as the base 26 may be provided at its edges with suitable lugs 35, 36 whereby it may be replaceably fastened to the fixed buck support, thus enabling the padded base to be conveniently mounted and removed for repair, replacement or other similar purpose.

The action of the spring padding shown in Figs. 6 and 7, when subjected to pressure is such that the covering 29 is given a lateral displacement at the same time that it is being compressed. This condition is represented diagrammatically in Figs. 8 and 9. Fig. 8 shows a portion of the lattice-like base 26 and a length of skewed spring 37 which is fastened to the base by the wire 33 or its equivalent. Considering this spring to support a localized area "*b*" of the covering 29, it will be seen that normally this area is separated from the base 36 by the width of the spring "*c*". When a pressure is applied to covering 29, the spring assumes a shape similar to that shown in Fig. 9 whereby the localized area "*b*" approaches the base 26 and is at the same time displaced laterally a dis-

tance "*d*". This lateral displacement of the padding and covering may be taken advantage of in pressing machines to give a wiping action on the garments simultaneous with the pressure. A portion of a pressing machine embodying this wiping feature is shown in Fig. 10 wherein the numeral 38 represents the movable buck or head of any well known type of garment press which is adapted to be lowered under pressure against the fixed buck represented generally by the numeral 39. As shown in this figure buck 39 comprises a casting 40 having an open-work face which may be similar to the lattice-like structure 26 of Figs. 6 and 7. Mounted upon the face 41 is a skewed spring resilient padding 42, which is preferably of the type shown in Figs. 6 and 7. The covering 43 preferably of fine-wire mesh cloth is supported by the padding 42 and is fastened around the edges of the buck in any suitable manner. The garments to be pressed are placed upon the lower buck 39 and the head 38 is lowered by hand or by suitable power mechanism to give the requisite squeeze on the garments. As the head "takes up" on the garments the padding 42 is compressed and displaced laterally in the direction of the arrow, causing a wiping action between the upper surface of the garment and the face of head 38, thus imparting a gloss or finish to the proper side of the garment.

Referring to Fig. 11, there is shown an alternative form of skeleton frame for an ironing roll in which the fins 44 are preferably cast with the notched lugs 45, around and through which passes a strong round wire 46 for supporting the spring padding in the spaces between the fins.

While only certain modifications have been shown others will be apparent to those skilled in the art, and it is to be understood that the character of the invention is to be limited only by the scope of the appended claims.

It will be noted that the radially extending fins 3 and the helically wound strips 4 constitute a skeleton-like roll having a grate-like outer surface. The expressions "skeleton roll" and "grate-like surface" as used in the claims are intended to cover such construction and its equivalents.

What I claim is:

1. In a laundry ironing machine, a roll comprising a plurality of longitudinally extending supporting frame members, a plurality of peripherally disposed members around said frame members, and convoluted springs disposed peripherally around said roll and supported by adjacent ones of said peripherally disposed members.

2. In a laundry ironing machine, a roll comprising a hub, a plurality of supporting members projecting radially from said hub and extending longitudinally of the axis thereof and having notches formed in their outer edges, a wire helically wound around said members in said notches to provide a plurality of spaced members encircling the hub in substantial parallelism and supported by said radial members, a coiled spring wrapped helically around the outer surface of said roll and resting upon the spaced wire members, and a metallic covering wrapped around and covering said coiled spring.

3. In a laundry ironing machine, a roll comprising a hub, a plurality of supporting members projecting radially from said hub and extending longitudinally of the axis thereof, a metal strip helically wound around said members to provide a plurality of spaced members encircling the hub in substantial parallelism and supported by said radial members, and a coiled spring wrapped helically around the periphery of said roll and resting upon the spaced members.

4. In a laundry ironing machine, a roll comprising a hub, a plurality of supporting members projecting radially from said hub and extending longitudinally of the axis thereof, a metal strip helically wound around said members to provide a plurality of spaced members encircling the hub in substantial parallelism and supported by said radial members, and a spring padding secured to the outer surface of said roll.

5. In a laundry ironing machine, a roll comprising a hub, a plurality of supporting members projecting radially from said hub and extending longitudinally of the axis thereof, a metal strip helically wound around said members to provide a plurality of spaced members encircling the hub in substantial parallelism and supported by said radial members, and a resilient metal padding secured to the outer surface of said roll.

6. In a laundry ironing machine, a roll comprising a hub, a plurality of supporting members projecting radially from said hub and extending longitudinally of the axis thereof, spaced members in contact with the outer extremities of said radial members and bridging the intervals therebetween to provide a grate-like surface for the roll, and a resilient padding secured to the outer surface of the roll.

7. In a laundry ironing machine, a roll comprising a hub, a plurality of supporting members projecting radially from said hub and extending longitudinally of the axis thereof, and spaced members in contact with the outer extremities of said radial members and bridging the intervals therebetween to provide a grate-like surface for the roll.

8. In a laundry ironing machine, a roll comprising a hub, a plurality of supporting members projecting radially from said hub and extending longitudinally of the axis thereof, a member wound helically around said radial supporting members and forming a grate-like surface for the roll, and a coiled

spring wound around said grate-like surface to form a helix of the same pitch as the pitch of said helically wound member.

9. In a laundry ironing machine, a roll comprising a hub, a plurality of supporting members projecting radially from said hub and extending longitudinally of the axis thereof, and a member wound helically around said radial supporting members with the convolutions of the helix spaced in substantial parallelism to provide with said radial supporting members a grate-like surface for the roll.

10. In a laundry ironing machine, a roll having a hub, a plurality of supporting members projecting radially from said hub and extending longitudially of the axis thereof, means encircling the hub and wound helically around the radial members to form a supporting surface, and a coiled spring wound around said supporting surface to form a helix of the same pitch as that of said means, with the convolutions of the helix interposed between the corresponding turns of said means so as to be supported thereby, the pitch of the helix being such that the turns of the coiled spring forming adjacent convolutions of the helix overlap at their edges.

11. In a laundry ironing machine, a roll having a hub, a plurality of supporting members projecting radially therefrom and extending longitudinally of the axis thereof, means encircling said hub and wound helically around said radial members to form a supporting surface, and a coiled spring wound helically around said supporting surface so as to form a helix of the same pitch as said means, with the center line of said coiled spring interposed between corresponding turns of said means.

In testimony whereof, I have signed my name to this specification this 9th day of April, 1928.

ARTHUR H. ADAMS.